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PENSOFT

New records of *Vriesea agostiniana* E.Pereira, and *Vriesea saltensis* Leme & L.Kollmann (Bromeliaceae, Tillandsioideae) from southeastern Brazil

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Abstract

Vriesea Lindl. (Bromeliaceae) has its center of diversity in eastern Brazil, especially in the Atlantic Rainforest domain. The present study extended the distribution of *V. agostiniana* to São Paulo state and *V. saltensis* to Espírito Santo state; they were previously considered endemic to single locations in the states of Rio de Janeiro and Minas Gerais, respectively. Species descriptions, taxonomic comments, and new distribution maps are presented, contributing to our knowledge of the taxonomy and biogeography of *Vriesea* in southeastern Brazil.

Key words

Biogeography, Bromeliads, Geographical distribution, Neotropics, Poales, SIG.

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Introduction

The Atlantic Rainforest is considered a biodiversity hot spot due to its species richness and high levels of anthropogenic disturbance (Myers et al. 2000). Bromeliaceae is one of the top ten Angiosperm families in the Brazilian Atlantic Rainforest domain in terms of diversity, comprising 926 species (BFG 2015), of which 653 are endemic (Martinelli et al. 2008). Southeastern Brazil contains the largest fragments of Atlantic Rainforest, as well as the largest number of inventoried Bromeliaceae species (Martinelli et al. 2008, Fontoura et al. 2012). Several bromeliad species from this domain have been described in recent years (Sobral and Sthemann 2009, see also Luther and Rabinowitz 2010, Gouda et al. 2017), with most of them being known only from their type-locality (Martinelli et al. 2008).

Vriesea Lindl. is the richest genus of Bromeliaceae in Brazil (BFG 2015), with approximately 210 species (Costa et al. 2014, Barfuss et al. 2016). Its center of diversity is the Atlantic Rainforest, with expressive species richness between southern Bahia state and northern Paraná state (Martinelli et al. 2008), with new taxa and new localities of this genus continually being discovered.

We describe here new records for 2 *Vriesea* species, expanding their known distributions. This paper reports the first record of *V. agostiniana* E.Pereira from São Paulo state, based on field collections conducted in 2014,

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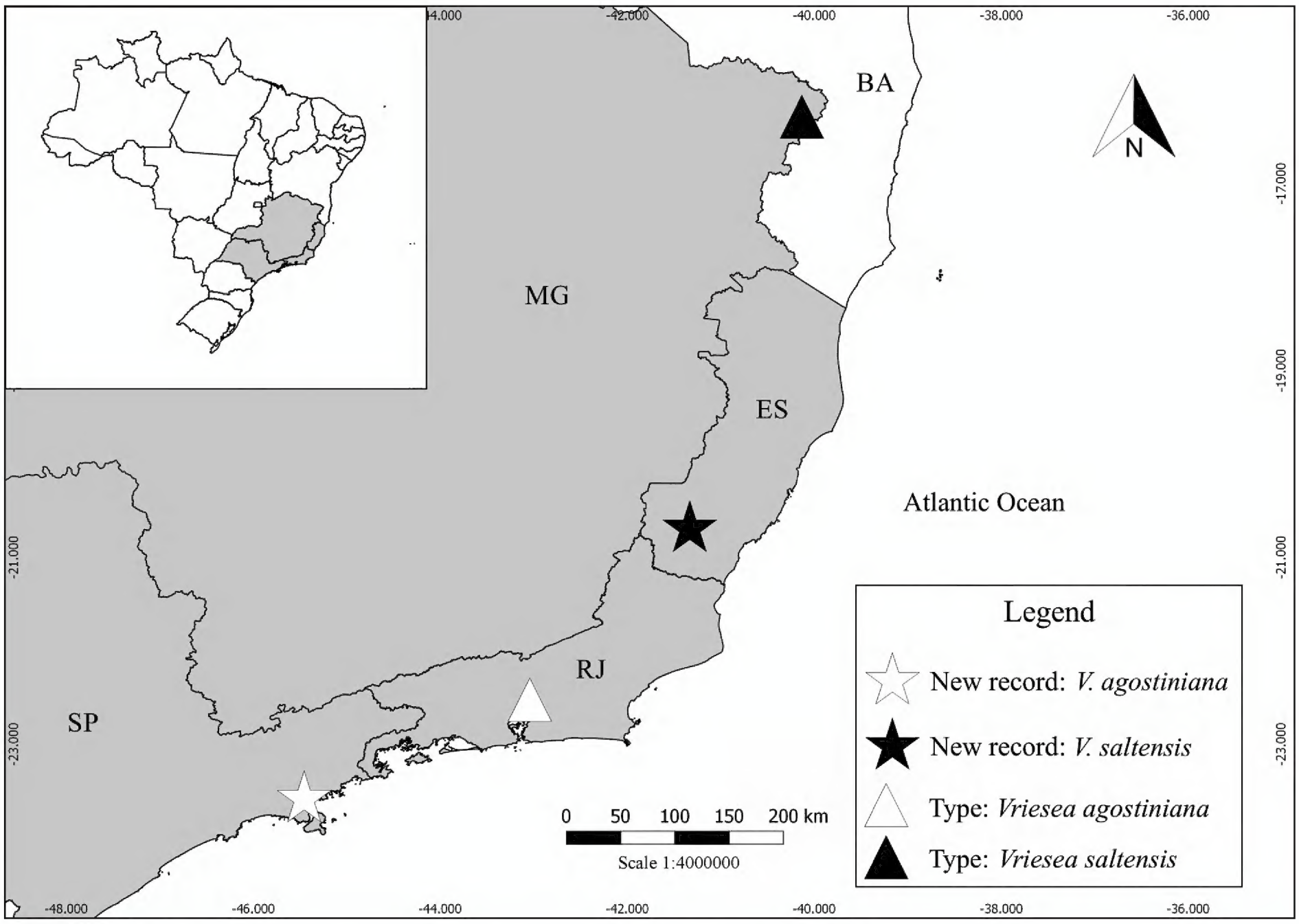

Figure 1. Map of the distributions of *Vriesea agostiniana* and *Vriesea saltensis* in eastern Brazil.

and increases to 53 the number of *Vriesea* species known from that state (previously 52; BFG 2015). We also report the first record of *V. saltensis* Leme & L. Kollmann from Espírito Santo state as a result of field surveys conducted between 2010 and 2013, which increases to 80 the number of *Vriesea* species known from that state (previously 79; BFG 2015).

Methods

Collections were conducted from 2010 to 2017 at Espírito Santo and São Paulo states during the expeditions of the project Systematics of Bromeliaceae developed at the Department of Botany, Museu Nacional, Universidade Federal do Rio de Janeiro. The descriptions follow the usual terminology for the family (Smith and Downs 1977) modified by Stearn (1973), Radford (1986), and Scharf and Gouda (2008). Vouchers of these new records were incorporated into the R and VIES herbaria (acronyms according to Thiers 2017). The identifications were confirmed by consulting the protologues of the taxa. The geodetic datum used was WGS84.

Results

New records.

Vriesea agostiniana. Brazil: São Paulo, Caraguatatuba, rodovia Caraguatatuba x São José, alto da serra, 23°35′13″ S, 045°27′28″ W, 06-IX-2014, old fl., I.M. Kessous and A.R. Pinto 152 (R 229000).

Vriesea saltensis. Brazil, Espírito Santo, Jerônimo Monteiro, Pedra das Andorinhas, 20°47′24″ S, 041°21′34″ W, 6-VIII-2013, fl. in cult. set. 2014, D.R. Couto 3304 and V.C. Manhães (R 232463); Cachoeiro de Itapemirim, Burarama, Pedra da Ema, 20°41′36″ S, 041°19′59″ W, 28-IV-2010, D.R. Couto 1592 and F.C. Favoreto (VIES 021398).

Identification.

***Vriesea agostiniana* E.Pereira**, Bradea 1 (5): 33–34. 1971. Type: Brazil, Rio de Janeiro, Santo Aleixo, 15-III-1970, A. Pereira and E. Pereira 10746 (Holotype HB 50839!, Isotype RB 143274!); ibid., E. Pereira 10732, 8-IX-1968 (Paratype RB 143275!). Figures 1, 2 (1).

Plant: epiphyte, ca 25 cm tall when flowering, propagating by axillary sprouts. Stem**:** short, concealed by the leaves. Leaves: suberect to arcuate, forming an infundibuliform rosette; sheath 9.5–11.5 × 5–6.5 cm, elliptic, greenish–white, lepidote on both sides; blade 15–40 × 2.3–3 cm, linear, apex obtuse to acute, with erect apiculate projection, green, sparsely lepidote. Inflorescence: 58–75 cm long, 13–15 flowers, with two sterile apical bracts, simple, pendulous, lax, with flowers spaced by 19–25 mm, distichous, suberect to patent; peduncle 20–38 cm long × 1.7–3.0 mm in diameter (when dry), internodes 2.7–3.1 cm long, curved, erect in the lower

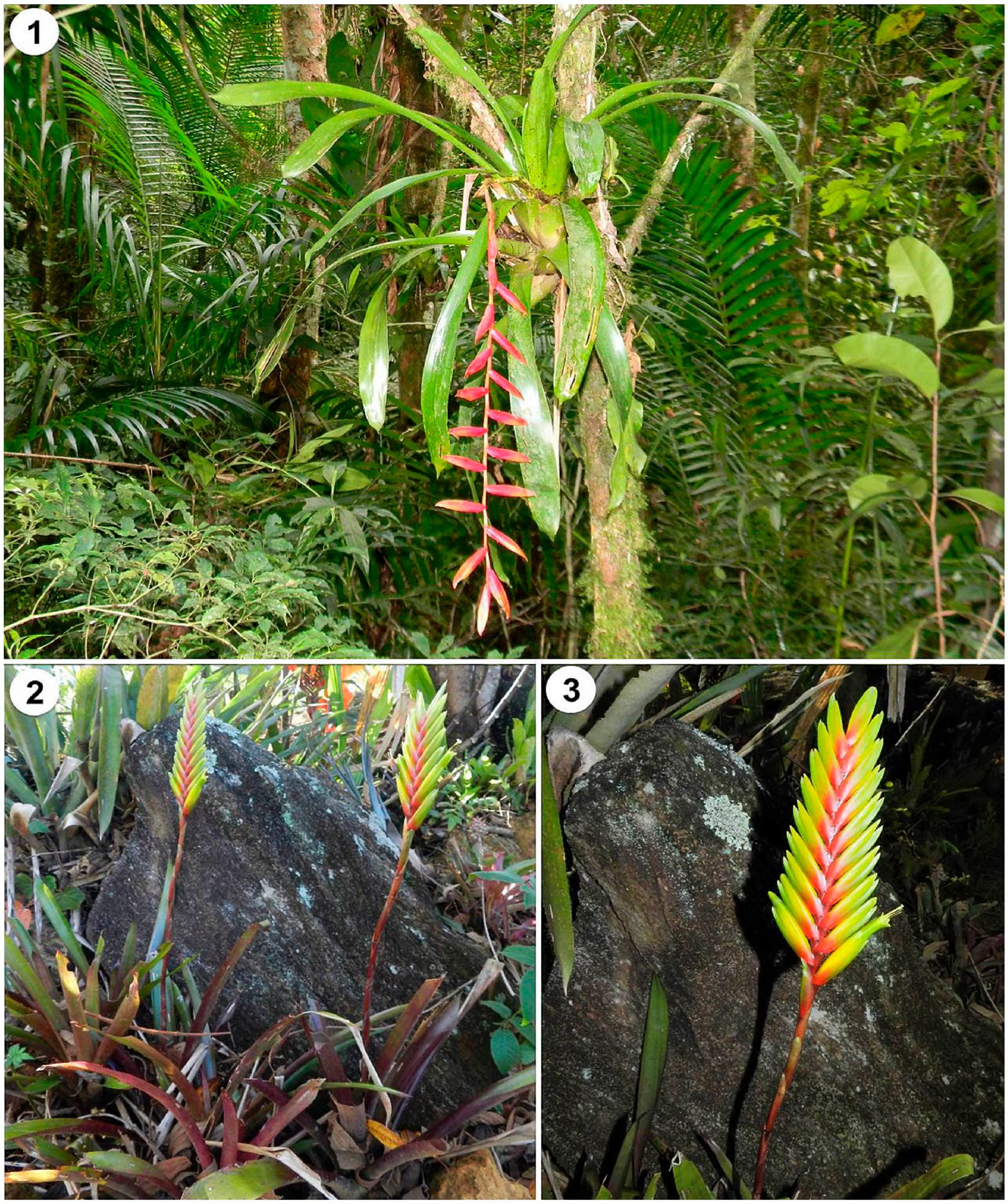

Figure 2. *Vriesea agostiniana* (1), epiphyte specimen collected in a Dense Ombrophilous Forest in Caraguatatuba, São Paulo state (I.M. Kessous 152), and *Vriesea saltensis* (D.R. Couto 3240), a terrestrial specimen from a Semideciduous Seasonal Forest at Jerônimo Monteiro, Espírito Santo state, Brazil, showing its habit (2) and a detail of the inflorescence (3). Photographs: (1) I.M. Kessous, (2, 3) D.R. Couto.

third and pendulous in the middle and upper thirds, greenish toward base, glabrous; peduncle bracts 3.6–4.1 × 1.7 cm, erect, imbricate, equal in length to the internodes, oblong to elliptic, apex obtuse, red, with lower portion greenish, lepidote, denser on adaxial side; rachis 30–32 cm long, 2–2.6 mm diameter, straight to slightly sinuous, with apical third inclined upwards, reddish–green, glabrous. Floral bracts: 4.4–4.6 × 3.3–3.5 cm, equal to or longer than the sepals broadly ovate, apex incurvate and acuminate-acute, red–vinose, carinate along the entire dorsal side, involute. Flowers: with diurnal anthesis, 55 mm long, pedicel ca 7 mm long; sepals 25–30 × 6.8–7.3 mm, oblong or oblanceolate, apex rounded, yellow, glabrous; petals ca 45 mm long, linear, apex rounded to obtuse, yellow with green tip, glabrous; petal appendages obtuse; stamens exserted; stigma convolute–blade type, style 45 mm long. Fruits: ca 4.5 cm long, fusiform, green or brown, with persistent floral bracts.

***Vriesea saltensis* Leme & L. Kollmann**, Phytotaxa 108 (1): 33–35. 2013. Type: Brazil, Minas Gerais, Santa Maria do Salto, ca 6 km after the city toward Talismã, 712 m elevation, 16°17.16′ S, 040°08.28′ W, 25-III-2010, E. Leme 8248 and L. Kollmann (Holotype RB 527263!). Figures 1, 2 (2, 3).

Plant: terricolous, ca 68–80 cm tall when flowering, propagating by axillary sprouts. Stem: short, concealed by the leaves. Leaves: erect to suberect, forming an infundibuliform rosette; sheath 9.5–10 × 4–5.5 cm, elliptic to oblong, greenish–white with vinose spots, dense lepidote on both sides; blade 39–46 × 3–3.2 cm, linear, apex acuminate, with an erect apiculate projection, vinose–green on adaxial side and vinose on abaxial side, densely lepidote at base and sparsely lepidote to the apex abaxially, sparsely lepidote adaxially. Inflorescence: 68–75 cm long, 13–22 flowers, with two sterile apical bracts, simple, erect, densely flowered, with flowers spaced by 5.7–8 mm, distichous, suberect; peduncle 49.5–59 cm long × 4.8–5.2 mm in diameter, internodes 2.7–3.1 cm, erect, vinose, glabrous; peduncle bracts 5.0–5.6 × 1.8–2 cm, erect, imbricate, distinctly longer than the internodes, lanceolate, apex acuminate-apiculate, lower and median portion completely vinose, upper portion vinose with green apex, basal bracts densely lepidote, upper bracts densely lepidote abaxially and sparsely lepidote adaxially; rachis 13–18 cm long, 2–3.1 mm diameter, geniculate, red, glabrous. Floral bracts: 3.3–4.1 × 1.8–2 cm, slightly shorter than the sepals, ovate, apex acute, yellowish–green, red at base, carinate, involute. Flowers: with diurnal anthesis, 4.3–4.9 cm long, pedicel red, ca 5 mm long; sepals 2.9–3.5 × 8.9–9.7 mm, oblong, apex obtuse, yellow in the middle to slightly green on the upper third, ecarinate, glabrous, coriaceous, free; petals 44–47 × 0.6–0.8 mm, oblanceolate to linear, apex rounded, slightly recurved, yellowish–green with green tip, glabrous, connate at base for 5.5–7 mm; petal appendages 6.9–10 × 2–2.5 mm, free for 3.5–4 mm, obtuse, rounded, rarely acute, irregularly dentate,; stamens exserted; stigma convolute–blade type, green, style 33–44 mm long. Fruits: not seen.

Discussion

Vriesea agostiniana was described by Edmundo Pereira based on material from Santo Aleixo, a locality at the base of the Serra dos Órgãos Mountains, in the municipality of Magé, in the Serra do Mar Range. Since then, it has only been reported for that area, and was therefore considered endemic to Rio de Janeiro state (Martinelli et al. 2008, BFG 2015). Although it was described more than 40 years ago, this species remains poorly sampled and is infrequently cited in the literature available concerning the genus. The new record of this species from São Paulo state was encountered in the municipality of Caraguatatuba, at the side of the Rodovia dos Tamoios highway (SP-099), approximately 650 m above sea level, in the Serra do Mar Range (approximately 250 km from the Serra dos Órgãos, its type locality). In spite of intensive fieldwork conducted during the preparation of the Flora of São Paulo state during the decades of 1980 through 2000, this species was not encountered (Wanderley and Martins 2007). *Vriesea agostiniana* differs from *V. simplex* (Vell.) Beer and *V.* × *retroflexa* É. Morren mainly in terms of the sizes and shapes of its floral bracts (Pereira 1971). It differs from *V. simplex* by having floral bracts entirely red-vinose (vs bright red with yellow apices), with incurvate apices (vs erect), carinate along the entire dorsal side (vs carinate near the apex), and by the lengths of the leaf blades (15–40 cm vs 15–25 cm). This new record will help to expand the potential distribution of this species in future biogeographic modeling studies.

Vriesea saltensis was described for the municipality of Santa Maria do Salto, in the semiarid region of Minas Gerais (Leme and Kollmann 2013), and was previously only known from that type locality. We describe here two new populations of *V. saltensis* located in the municipalities of Jerônimo Monteiro and Cachoeiro de Itapemirim, both in the southern region of Espírito Santo state. These new populations increase to three the known locations of *V. saltensis*. The new areas of occurrence are approximately 515 km in straight-line distance from the type locality, in a vegetation type associated with the rocky surfaces of granite and gneiss inselbergs, that flora being recognized as having significant biological importance (Martinelli 2007, Couto et al. 2016). Analysis of the new records of *V. saltensis* showed morphological differences in comparisons with the description presented in the protologue, especially with regard to a longer peduncle (49.5–59 cm vs 45 cm long) and the color of the peduncle bracts (vinose with apex slightly greenish vs red). *Vriesea saltensis* shows morphological affinity with *V. eltoniana* E. Pereira & I.A. Penna, from which it principally differs by the greater lengths of its peduncle (49.5–59 vs up to 25 cm), peduncle bracts (50–56 vs 25–35 mm), and petals (44–47 vs up to 38 mm), and by having taller individuals when flowering (68–80 vs 40–60 cm). In addition to those morphological characteristics, *V. saltensis* is encountered in Semideciduous Seasonal Forests associated with more inland granite and gneiss inselbergs (located approximately 60–120 km from the coast in the semiarid region of Minas Gerais state and in the central-southern portion of Espírito Santo state), while *V. eltoniana* is found in the coastal forests of Rio de Janeiro state (Leme and Kollmann 2013). *Vriesea saltensis* forms small populations with predominantly terrestrial habits in the interior of forests associated with inselbergs.

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Authors' Contributions

IMK and DRC collected the data; IMK, AFC, and DRC identification of taxa; IMK, DRC, FPU, and AFC wrote the text; and FPU made the map.

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